

CELESTION

24-inch Bass Reflex Enclosure

For use with Celestion TSQ2460



DESIGN/ BUILD NOTES

Celestion have designed a slot ported bass reflex enclosure for use with the TSQ2460 neodymium magnet cast aluminium chassis LF driver.

A ported or reflex cabinet is a simple box enclosure with one or more holes (ports) added on the front baffle. For most PA uses, this offers the best option for building a clean sounding loudspeaker cabinet that makes the most of the bass driver used. The addition of the port can extend bass driver performance and will also marginally improve the speaker's low frequency power handling and efficiency.

Cabinet specifications are:

Material	18mm birch ply
Design	Reflex – slot port
Cabinet volume	38.3L
Cabinet resonance (Fb)	29 Hz
Recommended high-pass filter	Linkwitz-Riley 4th order (24dB/oct) @ 15 Hz
Exterior dims	915mm (D) x 706mm (W) x 906mm (H)
Approx weight (loaded)	60kg

- The cabinet should be built from 18mm birch plywood to create a solid and non-resonant box.
- The required panel recesses can be cut via electric router or CNC.
- Alternatively, plans can be modified to allow construction via simple butt joints. It is important for joints to be secure and airtight.
- All joints should be securely screwed and glued.
- Front baffle layers should be laminated using non-expanding wood adhesive.
- The design allows you to finish the enclosure as you wish. A round over bit in a router can be used to smooth outside edges.
- The cabinet should be well damped internally via adding high density synthetic damping material on all surfaces except those making up the port.

Suggested accessories:

- 4x Penn Elcom H8805/06 handle
- 1x Penn Elcom D0947K dish
- 2x Neutrik NL4 D type surface mount speakON connector
- 8x M8 x 50mm socket cap head screw
- 8x M8 T-nuts
- Self-adhesive backed neoprene foam gasket strip – 2m long, 8mm wide
- Recommended speaker cable - minimum 2.5mm² stranded copper
- Expanding PU wood glue (for joints)
- Non-expanding PVA wood glue (for baffle lamination)
- 50mm wadding
- Self-adhesive spray

Since the driver will become unloaded below the port tuning frequency, the cabinet should be used with a high-pass filter to prevent damage at high input levels. For this TSQ2460 cabinet, a suitable value for this filter is a Linkwitz-Riley 4th order (24dB/oct) @ 15 Hz.

Recommended filter slopes: 24dB/oct

The following DSP settings can be used to achieve a flat response with the highest possible SPL:

- High-pass filter: Linkwitz-Riley 4th order (24dB/oct) @ 15 Hz
- Low-pass filter: Butterworth 4th order (24dB/oct) @ 80 Hz

LF Loudspeakers

TSQ2460



24-inch cast aluminium chassis neodymium magnet low frequency loudspeaker

- Advanced temperature control using 3-channel tuned venting system provides highly efficient cooling across the frequency band
- Voice coil typically operates at up to 80°C lower temperature than other leading drivers in this class
- Polysiloxane laminated double suspension provides much greater stability and improved cone displacement symmetry
- Lead-out wires precision woven into suspension minimises excess motion and reduces fatigue
- Double-sided, weatherproof cone coating enhances durability

4800W

Continuous power rating

98dB

sensitivity

6in

Round copper voice coil

Mounting Information

Overall diameter	627mm / 24.7in
Overall depth	280mm / 11in
Cut-out diameter	571mm / 22.5in
Mounting hole dimensions	8.5x9mm / 0.33x0.35in
Number of mounting holes	8
Mounting hole PCD	596.3-606mm / 23.47-23.86in
Flange & gasket thickness	21mm / 0.83in
Unit weight	22kg / 48lb

Packed Dimensions & Weight

Single pack size W x D x H	650mm x 650mm x 290mm / x 25.5in x 25.5in x 11.4in
Single pack weight	25kg / 55lb

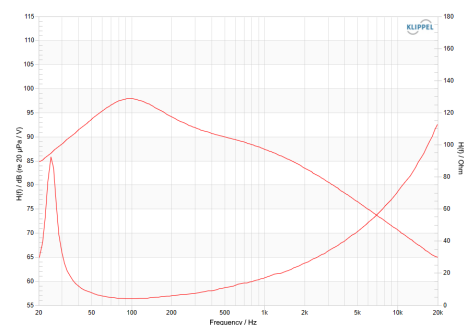
General Specifications

Nominal Diameter	610mm / 24in
Power Rating	2400W
Continuous power rating	4800W
Rated impedance	4, 8 ohm
Sensitivity	98dB
Frequency range	20-200Hz
Chassis type	Cast aluminium
Magnet type	Neodymium
Voice coil diameter	152mm / 6in
Voice coil material	Round copper
Former material	Glass fibre
Cone material	Glass loaded cellulose, & water-resistant coating
Surround material	Triple roll, cloth sealed
Suspension	Triple, polysiloxane-laminated
Gap height (Hg)	15mm / 0.59in
VC winding height (Hvc)	45mm / 1.77in

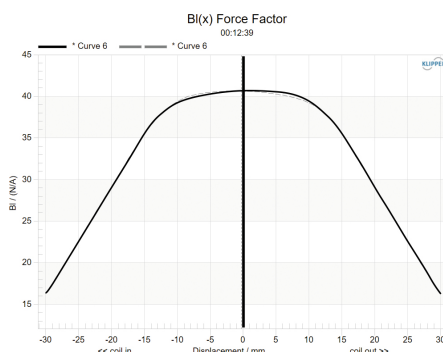
Parameters

Sd	2239cm ² / 347in ²
Fs	27Hz
Mms	717.2g / 25.3oz
Qms	10.89
Qes	0.312
Qts	0.303
Re	3.17 ohm
Vas	344.5l / 12.17ft ³
Bl	35.23Tm
Cms	0.048mm/N
Rms	11.089kg/s
Le (at 1kHz)	2.05mH
Xmax	18.75mm / 0.73in
Xmech	74mm / 2.91in
Efficiency	2%

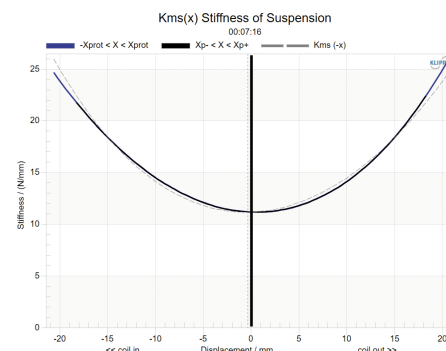
Frequency response and impedance



Force factor Bl symmetry



Stiffness K symmetry



Power rating: Tested for two hours using a continuous, band-limited pink noise signal as per AES standard. Power calculated on minimum impedance. Loudspeaker tested in free air.

Continuous power rating: Defined as 3dB greater than the AES rating.

Sensitivity: Measured on axis at 1W, 1m in 2° anechoic environment.

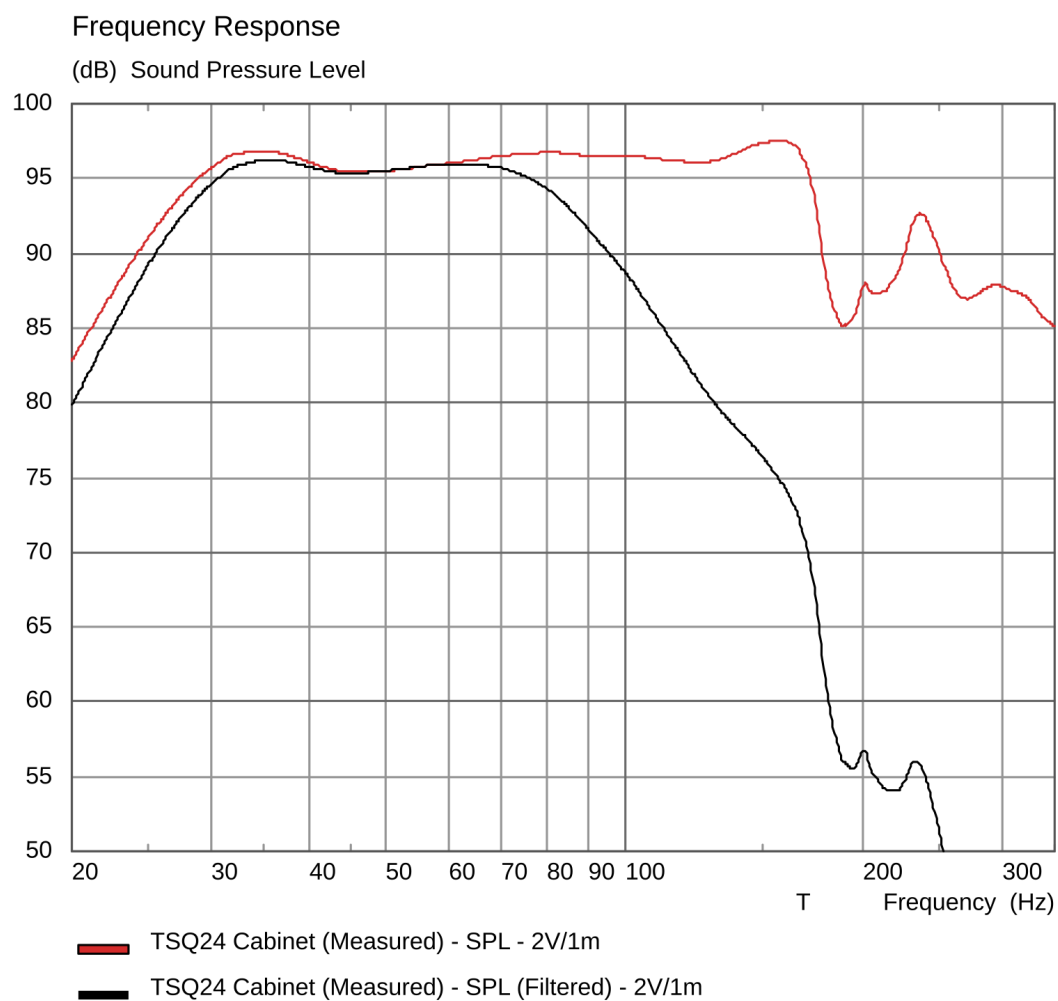
Parameters: Measured after unit subjected to pre-conditioning signal. 4 ohm parameters shown.

Xmax: 0.5*(Hvc-Hg) + 0.25*Hg

Xmech: Maximum peak-to-peak excursion before damage.

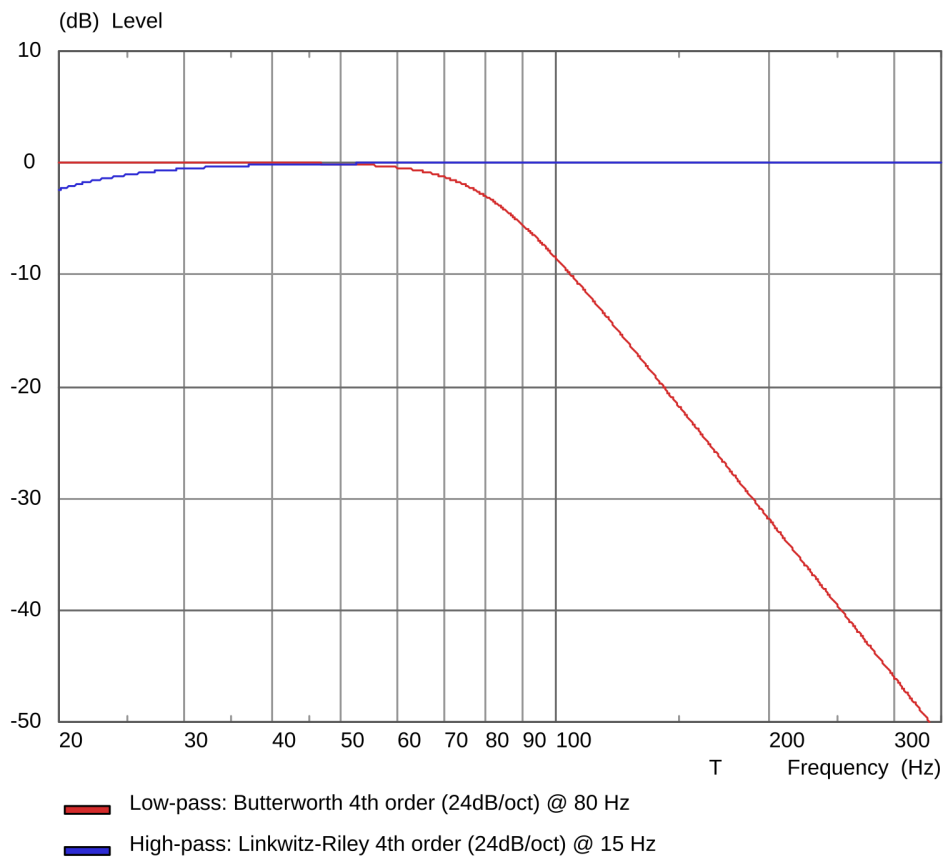
* Simulated data

TSQ2460 Reflex Enclosure: System Response Curves



Nearfield response is used as suggested by Klippel Application Note AN39.

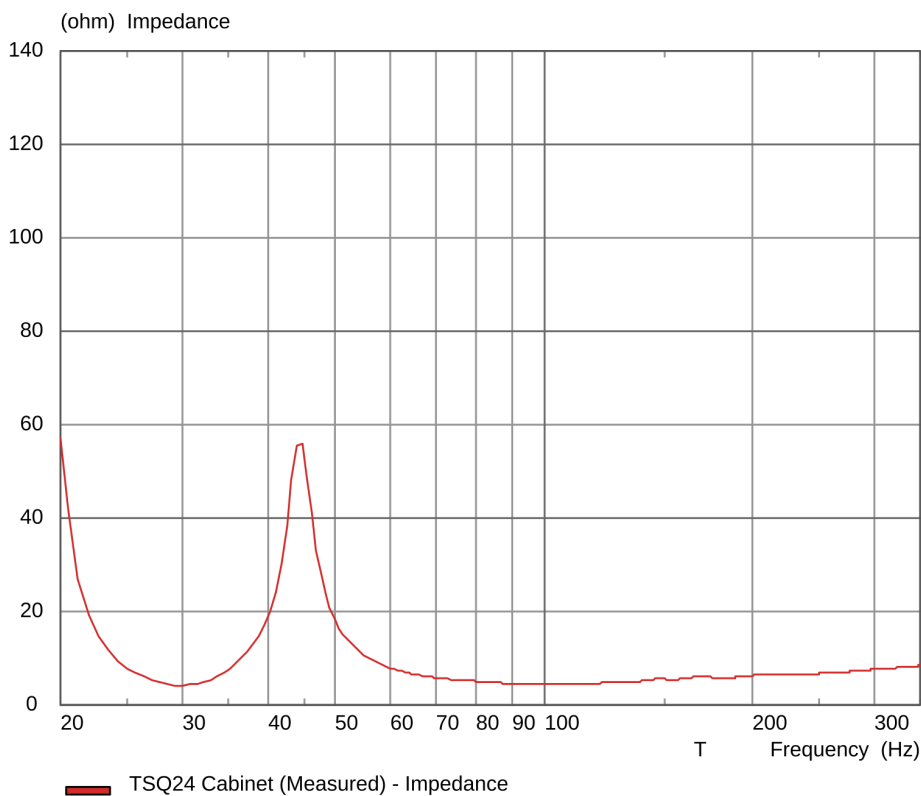
Filters Response



Recommended filters:

- HPF – Linkwitz-Riley 4th order (24dB/oct) @ 15 Hz
- LPF – Butterworth 4th order (24dB/oct) @ 80 Hz

Impedance



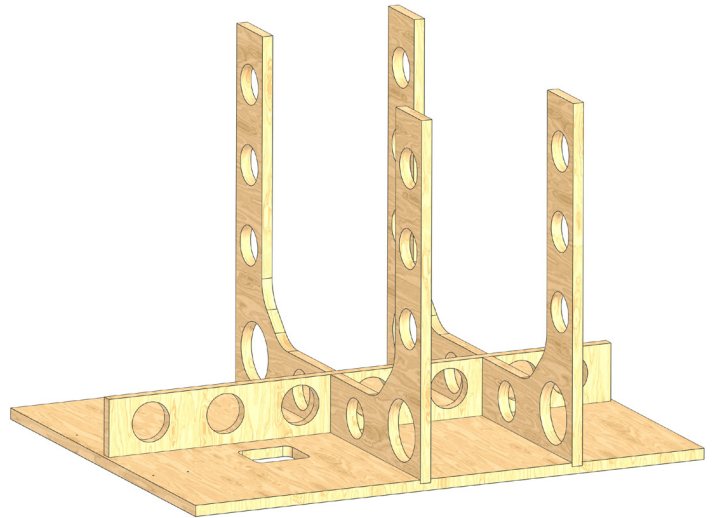
ASSEMBLY GUIDE

Step one

Lay the back panel on the floor, with the inside facing upward.

Place the two U-braces and crossmember in the routed channels.

Use this assembly to help square up for step two.

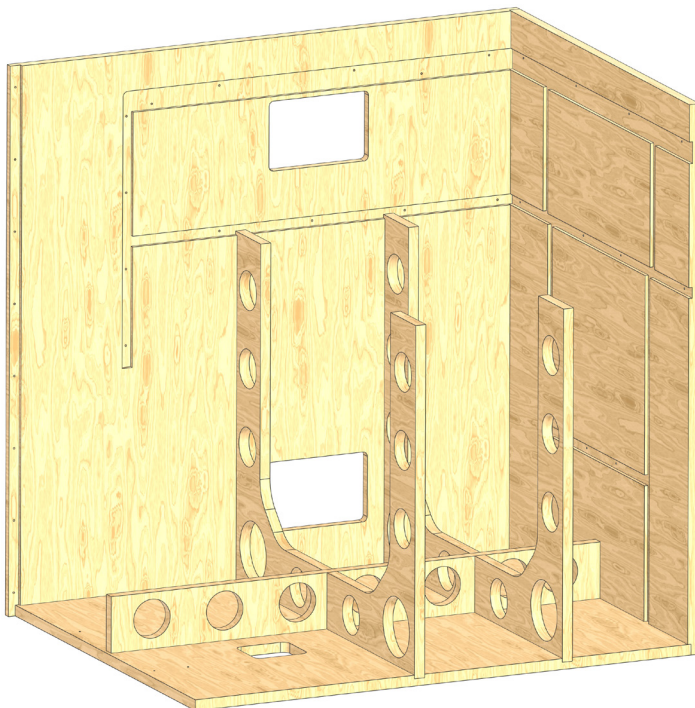


Step two

Glue and screw the top and left-hand panels together.

Square up the top and left side panels to the back panel assembly. A 90 degree clamp may be used on the upper side.

Leave to set for a short while.

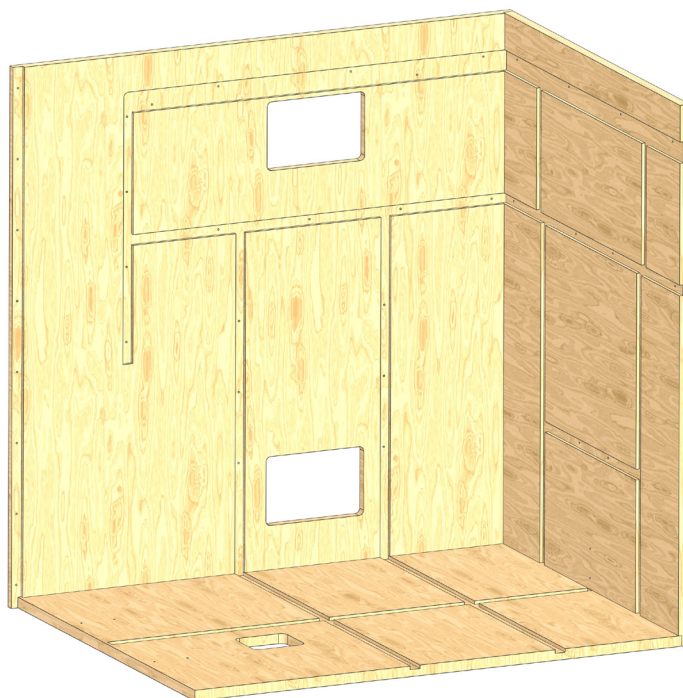


Step three

Remove the 'squaring assembly'.

Tip the top/ left panel assembly onto the left panel in order to be able to glue and screw the bottom panel.

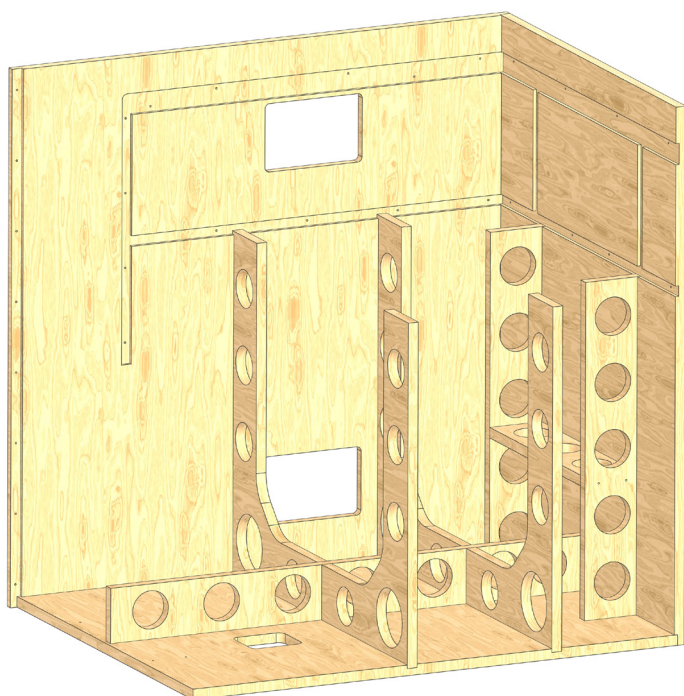
Tip back then glue the U-braces and crossmember to the back panel/ side, and fix with screws.



Step four

Attach one side of the H-brace outside of the cabinet, fixing with glue and screws.

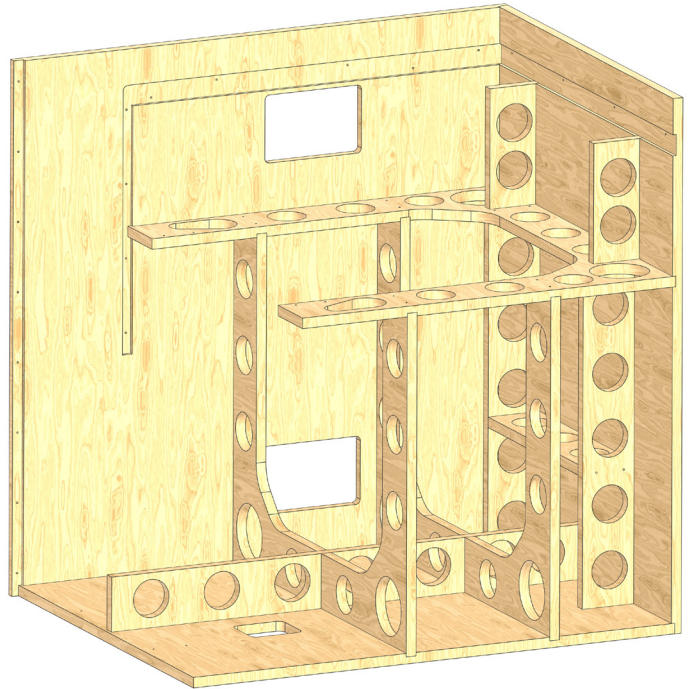
Once attached, attach the remainder of the H-brace.



Step five

Glue the main U-brace in place, and fix with screws.

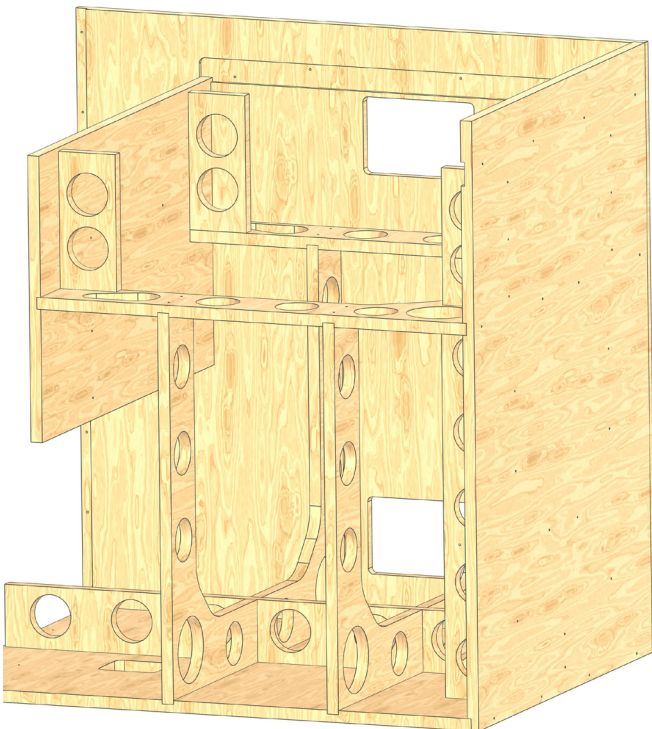
Once complete, add the two top small braces.



Step six

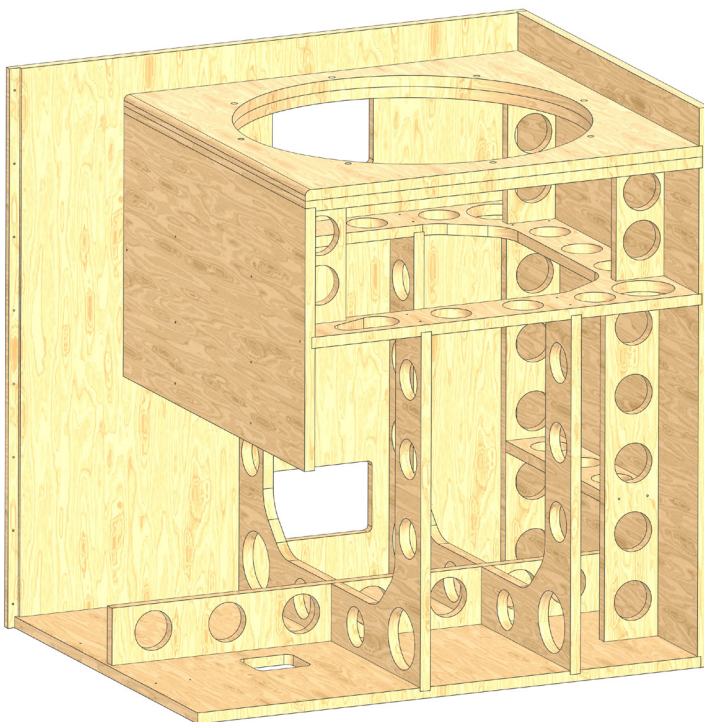
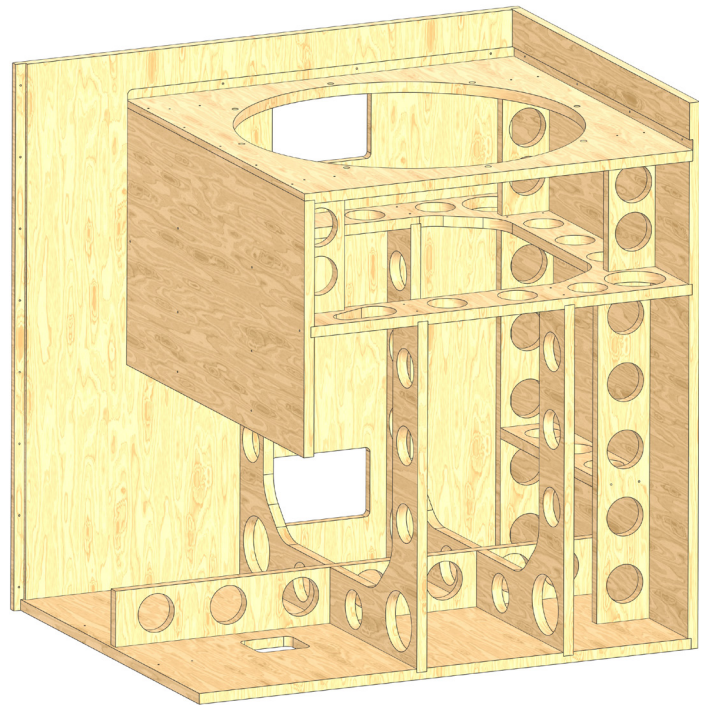
Glue the port section, and fix with screws.

Attach the remaining 2x small braces (U-brace to port/ baffle) with glue and screws.



Step seven

Glue the inner baffle, and fix with screws.



Step eight

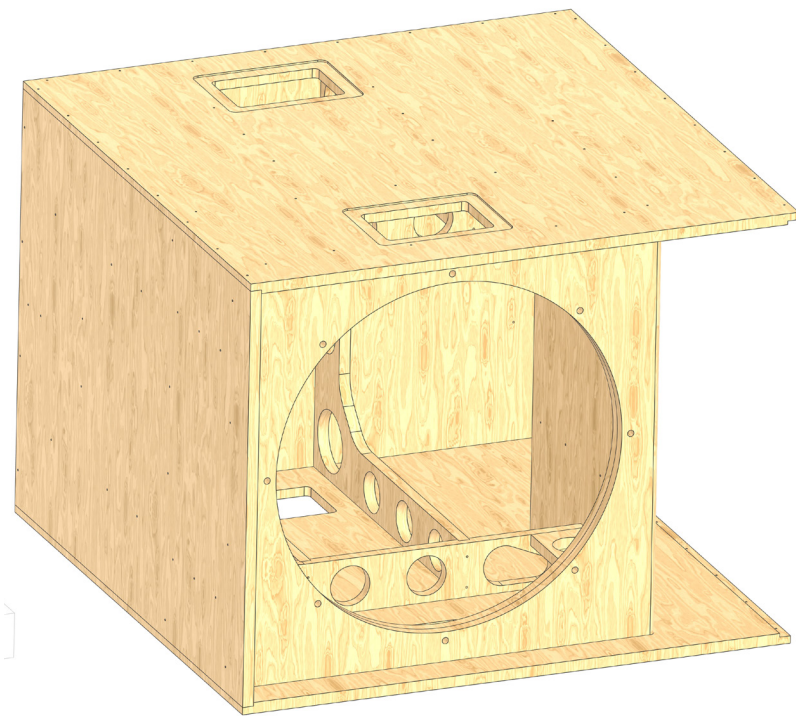
Apply non-expanding glue to inner baffle and slide the front baffle into place.

Add clamps to secure in place and leave to dry.

Remove clamps before continuing.

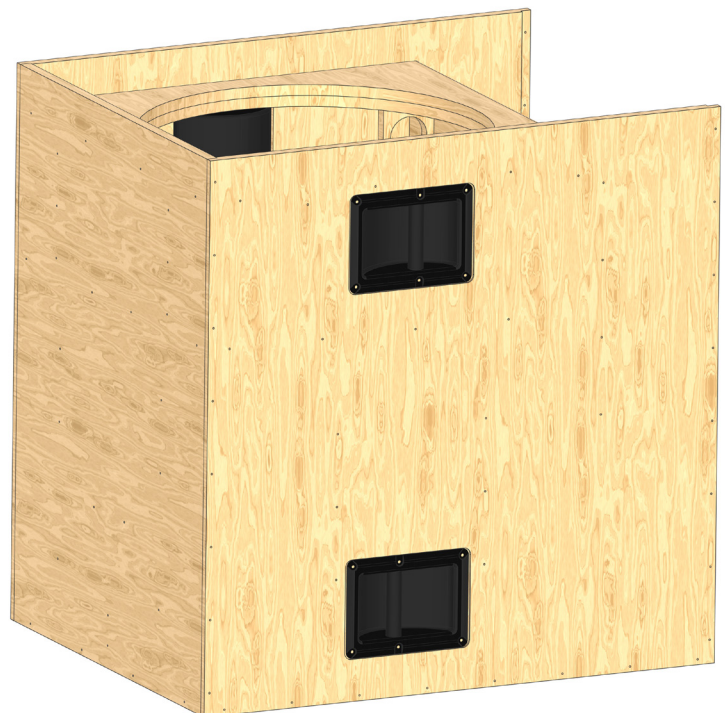
Step nine

Glue the right side panel, and fix with screws.



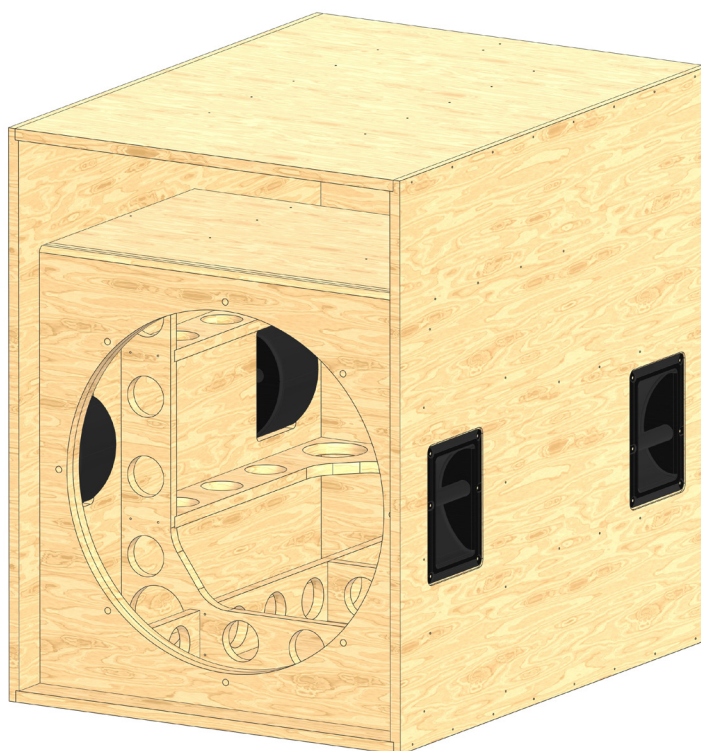
Step ten

Apply handle gaskets and fix handles with screws.



Step eleven

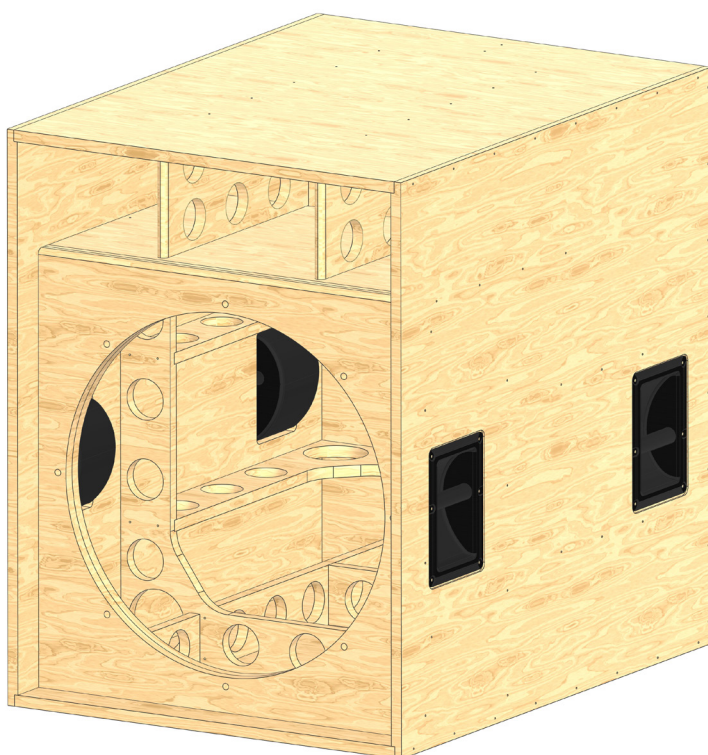
Apply wadding to inside the cabinet and fix with self-adhesive spray and staples.



Step twelve

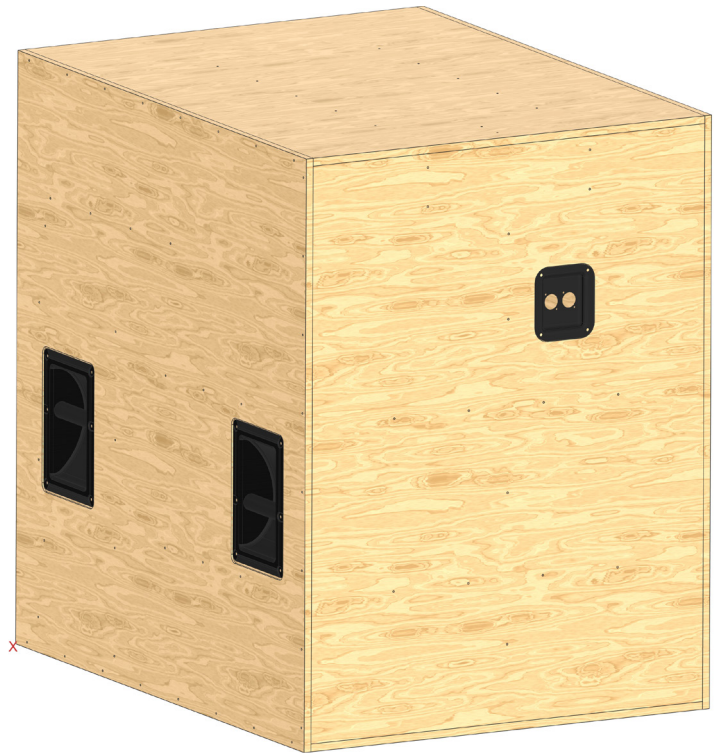
Glue the bottom panel in place, and fix with screws.

Add the bottom/ port bracing, and glue in place.



Step thirteen

Apply connector panel gasket and fix panel with screws.



Step fourteen

Apply driver gasket.

Add T-nuts and connect the speaker cable to the rear connectors.

Install the driver, ensuring terminals are connected correctly.

Complete your build with your desired finish.

